Partnerships in Monitoring: A Water Quality Example from American Samoa

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Abstract

Quality environmental monitoring is a logistically and financially challenging endeavor. For this reason, the National Park of American Samoa (NPSA) developed partnerships with the American Samoa Environmental Protection Agency (ASEPA) and the United States Environmental Protection Agency (USEPA) in 2004 to conduct a Territory-wide water quality survey. This survey utilized the Environmental Monitoring and Assessment Program (EMAP) protocols, and its purpose was to document a set of environmental indicators to assess the ecological condition of coastal resources. Water, fish, and sediments were collected from fifty sites selected randomly in Territorial coastal waters. The study design allows a comprehensive assessment of the condition of Territorial waters and quantifies the condition of National Park waters relative to the Territory. A significant benefit from this partnership is the identification of emerging water quality concerns in this remote island Territory.

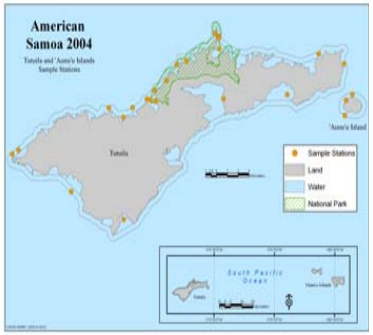
Partnerships

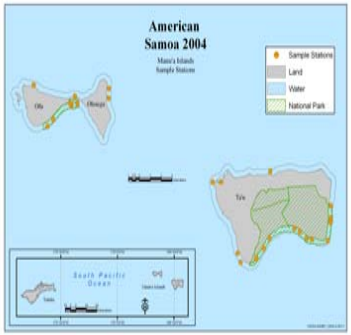
Funding, logistics, and personnel have been barriers to quality environmental monitoring for the National Park of American Samoa (NPSA) and other island agencies. For this reason, NPSA developed partnerships with the American Samoa Environmental Protection Agency (ASEPA) and the United States Environmental Protection Agency (USEPA) to conduct this water quality survey. Each of these agencies share a common goal of protecting aquatic ecosystems. Similarities in each agency's mandate made these partnerships a natural fit.

- **NPSA** *"…conserve the scenery and the natural and historic objects and the wild life therein; and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."* (16 U.S.C 1)
- **USEPA** *"…assemble, coordinate, and organize all existing pertinent information on the Nation's estuaries and estuarine zones; carry out a program of investigations and surveys to supplement existing information in representative estuaries and estuarine zones; and identify the problems and areas where further research and study are required."* (Title 33, Chapter 26, Section 104 (n)(2) of the Federal Water Pollution Control Act)
- **ASEPA** *"…carry out the consolidated environmental program, including water pollution control, safe drinking water, solid hazardous waste, air pollution control, pesticide use and certification, and environmental awareness and education."* (Executive Order No. 16-1987)

Agency contributions to this effort include:

- **NPSA –** personnel time, boat support, field logistics, local contracts
- **USEPA –** financial support, study design, sample analysis
- **ASEPA –** personnel time, laboratory space, bacteria analysis





Conclusions

The National Park Service has been challenged to standardize natural resource monitoring on a programmatic basis throughout the agency. This will ensure that park units possess the resource information needed for effective, science-based, resource protection. Other agencies have similar challenges ahead of them. Partnerships, such as those illustrated here, will go a long way towards efficiently pooling limited resources for environmental monitoring to benefit multiple agencies.

Background

American Samoa is the southernmost US Territory located in the South Pacific approximately 4,200 kilometers south of Hawaii (see below). The Territory consists of five inhabited volcanic islands (Tutuila, Aunu'u, Ofu, Olosega, and Ta'u) and two atolls (Rose and Swains). Since 1980, human population has increased from approximately 35,000 to over 60,000; increasing pressure on the Territory's limited resources. This exponential population growth is a major concern to the islands of American Samoa as land use impacts pose a threat to near shore shallow water habitats.

Sample Design

The National Park of American Samoa (NPSA) has identified water quality monitoring as a key component of its coral reef monitoring program. To date there has never been a comprehensive near shore water quality monitoring effort in place for either NPSA or the Territory. The purpose of this survey was to document a set of environmental indicators to assess the ecological condition of coastal resources. A probabilistic design was used to allow a comprehensive assessment of the condition of Territorial waters and quantify the condition of National Park waters relative to the territory. This design relies on random sample locations to attain an unbiased estimate of environmental condition. Water, fish, and sediments were collected from fifty randomly-selected sites in Territorial coastal waters extending out ¼ mile from shore. Of these 50 stations, approximately ½ were constrained to within park boundaries, while the other ½ were cast around the remaining Territorial waters. Samples were collected from these stations during a sampling window between April-October, 2004, and are currently being analyzed. A report on the condition of coastal ecosystems in American Samoa and National Park of American Samoa is expected to be complete in 2006.

Indicators Measured

Physiochemical Variables	pH, Dissolved Oxygen, Temperature, Salinity
Nutrients	Total Nitrogen, Total Phosphorus, Nitrate, Nitrite, Ammonium, Phosphate
Water Clarity	PAR, Total Suspended Solids, Chlorophyll *a*, Secchi
Contaminant Loading	Fish Tissue, Sediment Metals, Sediment Organics
Sediment Characterization	Total Organic Carbon, Grain Size

Acknowledgements

This work could not have been accomplished without the support of the staff of the National Park of American Samoa, US Environmental Protection Agency (Gulf Ecology Division, Atlantic Ecology Division), and the American Samoa Environmental Protection Agency. Additional support came from Industrial Gases, AECOS, Vaoto Lodge, and the Villages of American Samoa.